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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,693	08/17/2001	Koji Matsuo	KOJIM-417	1573

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EXAMINER	
LOPEZ, CARLOS N	

ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/930,693	MATSUO ET AL.	
	Examiner	Art Unit	
	Carlos Lopez	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,7-13,15 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-13,15-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 7-11, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkey et al (US 6,319,634) in view of Iino et al (US 5,210,816) and/or Deliso et al (US 6,263,706) and in further view of Otsuka et al (US 6,333,284). Berkey discloses a method of making a photomask blank by the flame hydrolysis method. As shown by Berkey in bridging paragraph of columns 5-6 and figure 8, porous silica matrix is produced by feeding oxygen gas, hydrogen gas, a silica-forming reactant gas, from a burner to a reaction zone, flame hydrolyzing the silica-forming reactant gas in the reaction zone to form fine particles of silica and depositing the silica particles on a rotatable substrate (42) in the reaction zone. The claimed angle between the burner 48 and the formed silica matrix 46 is 90 degrees as shown in figure 8. The claimed heating and vitrifying in a fluorine atmosphere is taught in column 8, lines 12-15 and Col. 7 lines 40-50. In regards to the claimed single burner limitation, applicant is directed to figure 8, showing the single burner at 90 degrees.

Berkey further notes that the transmission of the glass preform tube, for which a photomask is derived, is preferably homogenous at –2% to +2% (Col. 13, lines 55ff). Since the preform is only being doped with fluorine and it is known that the concentration distribution of the fluorine will have a direct effect on the homogeneity of

the photomask transmission, one of ordinary skill in the art would thus reason that the distribution of the fluorine concentration should be constant, zero. Applicant is also directed to examples 1 through 4 of Berkey showing a uniform concentration of fluorine.

Berkey does not disclose the density distribution of the photomask blank. However, Iino et al notes that silica soot is easier to dope with fluorine when it has a low density and harder when its density is higher (See Bridging paragraph 3-4 and Col. 4, lines 34ff). As alternatively explained by Deliso et al in Col. 1, lines 35-39, the lower the silica density the higher the fluorine dopant will be in the silica soot. Also note Deliso teaching homogenous fluorine doping requires constant soot density (Col. 4, lines 55ff). Hence in order to achieve a homogenous transmission/fluorine concentration as sought by Berkey, the silica soot should have a constant density distribution in order to avoid having areas that affect fluorine concentration, transmission.

Thus in view that the degree of doping concentration depends on the density of silica as noted by Deliso and Iino above, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have density of the silica soot constant, zero, in order to achieve the desired homogenous optical transmission and a constant fluorine concentration through out the glass blank as taught by Berkey.

In regards to the claimed silica density, Otsuka teaches that the silica density for synthetic glass quartz, intended to be used for lithography photomask, have a density range of .3 to .6g/cm^3 or preferably 0.4 to 0.5 g/cm^3 in order to assure the complete removal of hydroxyl groups during vitrification. Hence, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have

provided Berkey's silica matrix with a constant density as taught by Deliso and Iino with a silica matrix density of .3 to .6g/cm^3 as taught by Otsuka in order to assure complete removal of hydroxyl groups during vitrification.

As for claim 2, Berkey in col. 8, lines5 ff, discloses feeding fluorine in the reaction zone along with the silica-forming reactant gas.

As for claims 7-9, Berkey teaches of using silicone tetrachloride, siloxane SiO_2, which would include the claimed tetramethylsiloxane, and silicone tetrafluoride (Col. 6, lines 15ff).

As for claims 10-11, Berkey in Col. 7 lines 40-50, discloses doping the silica matrix in a fluorine atmosphere containing helium.

As for claim 15, the silica matrix in figure 8 of Berkey has a cylindrical form.

It is noted to applicant that the while it is true that Deliso and Iino are drawn to the formation of silica matrix for the production of an optical fiber, in contrast to Berkey's method for photomask production, the teachings and principles that govern the doping of a silica matrix per se, are generic that are applied to the formation of silica matrix regardless its intended purposes whether is for photomask or optical fiber production.

As for claim 16, glass blank are conventionally done by various methods such as the OVD, MCVD and VAD process. It would be obvious to a person of ordinary skill in the art to practice any of the above mentioned methods in order to provide a glass blank.

Claims 3 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkey et al (US 6,319,634) in view of Iino et al (US 5,210,816) and/or Deliso et al (US 6,263,706) and in further view of Otsuka et al (US 6,333,284) as applied to claim 1 above, and in further of Shiraishi et al (US 6,653,024). Berkey is silent treating the photomask blank quartz glass in a hydrogen-containing atmosphere. However, Shiraishi teaches in bridging paragraph of col. 18-19: "Further, the fluorine-doped synthetic silica glass is heat treated in a hydrogen gas-containing atmosphere to obtain fluorine- and hydrogen-doped synthetic silica glass (S5). As the hydrogen gas-containing atmosphere, an inert gas atmosphere containing 0.1 to 100vol % of hydrogen gas is preferable". As noted by Shiraishi (Bridging paragraph of col. 18-19), the doping hydrogen is done at relatively low temperature, not more than 500 degrees Celsius, in this manner hydrogen molecules can be doped in the glass in a hydrogen molecules state, H_2, without creation of Si-H bonds with the glass, which easily become unwanted E'centers, and without causing a reduction of the Si-F bonds of the fluorine doped glass. Thus, the doped glass having hydrogen atoms terminates any E'centers produced by exposure to ultraviolet rays and a stronger UV resistance glass can be obtained (Bridging paragraph of col. 18-19). Thus, at the time the invention was made it would have been obvious to a person of ordinary skill in the art to have heat treat Berkey's glass, made by the combined teachings of Otsuka and Iino/Deliso, in a hydrogen containing atmosphere at a temperature of not more than 500 degrees Celsius, in order to obtain a stronger UV resistant glass.

Response to Arguments

Applicant's arguments filed 3/9/05 have been fully considered but they are not persuasive. In response to applicant's arguments against the Berkey and Deliso

references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that "Berkey fails to teach or suggest this distribution because Berkey discloses an OVD method. As such, the OVD method would make a glass tube with a lower density at the outer surface than at its center portion." Applicant does not provide evidence to make the assertion that the Berkey's method is an OVD process and due to a density non-uniformity creates a distribution transmittance. In fact Berkey's method of producing a synthetic quartz glass mirrors the claimed method, consequently in making the above argument about, applicant is also be undermining its own invention. Are the claimed steps of feeding oxygen gas, hydrogen gas, a silica-forming reactant gas, from a burner to a reaction zone, flame hydrolyzing the silica-forming reactant gas in the reaction zone to form fine particles of silica and depositing the silica particles on a rotatable substrate different from the disclosed steps of Berkey that make it a non-OVD process?

In regards to the arguments presented to Deliso, applicant fails to recognize that that Deliso is being cited to show the general knowledge of a person of ordinary skill in the art. The teachings of Deliso clearly show that the degree of doping is directly dependent on the density of silica soot. Hence, in providing a uniform transmission by a photolithography glass blank as done by Berkey, uniform fluorine doping of the blank would be necessary and would be required to have a constant soot density as taught by Deliso.

Applicant is also directed to Iino teaching that silica soot is easier to dope with fluorine at lower concentration than at higher concentrations. This shows that a blank having varying density would not be uniformly doped and consequently would not have a uniform transmission. Thus in order to achieve a constant transmission by a photolithography glass blank, as desired by Berkey, the photolithography glass blank should have a constant density in order to allow for a uniform fluorine doping; A dopant that has direct effect on the transmission of the glass blank.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Lopez whose telephone number is 571.272.1193. The examiner can normally be reached on Mon.-Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571.272.1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CL
May 22, 2005

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